[Claims]

1. A method of determining geometrical data of a motor vehicle wheel mounted rotatably about an axis of rotation, in which a plurality of measurement points on the rotating wheel are scanned in contactless mode,

characterised in that in at least two planes perpendicular to the axis of rotation the spacings of a plurality of measurement points on a respective periphery of the corresponding part of the wheel from a reference location and the rotary angle positions of the respective measurement points are measured and that the position of the motor vehicle wheel with respect to the axis of rotation is determined from the measurement values.

2. A method according to claim 1

characterised in that the position, in particular the eccentricity and/or the angle of inclination of the geometrical axis of the wheel, with respect to the axis of rotation, is or are determined from the measurement values.

3. A method according to claim 1 or claim 2

characterised in that the measurement points are scanned on a surface of the part of the wheel, which is substantially parallel to the axis of the wheel, and/or a surface of the part of the wheel, which is substantially inclined or perpendicular.

4. A method according to one of claims 1 to 3

characterised in that a lateral wobble (run out) and/or radial wobble (run out) on the wheel is or are ascertained from the measurement values.

5. A method according to one of claims 1 to 4

characterised in that the measurement points are scanned on parts of the wheel of the inside of the wheel and/or the outside of the wheel and/or at the periphery of the wheel.

6. A method according to one of claims 1 to 5

characterised in that the position ascertained from the measurement values, in particular eccentricity and/or inclination of the geometrical axis of the wheel with respect to the axis of rotation is or are used for correction of balancing parameters (balancing mass, angular position) which are ascertained in an unbalance measuring operation.

7. A method according to one of the claims 4 to 6

characterized by ascertaining the run out data of the rim and the unbalance data of the vehicle wheel in a first positional relationship of the tyre and the rim, and by matching the rim and the tyre in a second positional relationship to minimize the effects of the run out of the rim and of the unbalance of the vehicle wheel.

8. A method of determining geometrical data of a motor vehicle wheel mounted rotatably about an axis of rotation, in which a plurality of measurement points on the rotating wheel are scanned in contactless mode, in particular according to one of claims 1 to 7,

characterised in that the spacings of measurement points on the pneumatic tyre of the motor vehicle wheel and in particular on one or more peripheral lines about the axis of rotation, relative to a reference location, are measured at different inflation pressures.

9. A method according to claim 8 characterized by ascertaining the run out data of the rim and the stiffness data of the tyre in a first positional relationship of the tyre and the rim, and by matching the rim and the tyre in a second positional relationship to minimize the effects of the run out of the rim and of the difference of stiffness around the circumference of the tyre.

10. A method according to claim 9

characterised in that tyre irregularities, in particular tyre stiffness values, in the peripheral direction of the pneumatic tyre, are ascertained from the differences in the spacing measurement values for the respective measurement points.

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11. Apparatus for determining geometrical data of a motor vehicle wheel (2) mounted rotatably about an axis of rotation (1), comprising a contactless scanning device (3) connected to a spacing measuring device (4) which measures the spacing of a measurement point scanned on the wheel (2) from a reference location (5), and an evaluation device (7) which evaluates the measurement values,

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characterised in that a rotary angle sensor (6) for determining the respective rotary angle positions of the scanned measurement points during rotation of the wheel about the axis of rotation (1) is connected to the evaluation device (7), and that the evaluation device (7) has a computer which from the spacings of the measurement points from the reference location (5) and the respective rotary angle positions of the measurement points which are on at least two peripheries on parts of the wheel, which peripheries are in planes (19, 20) perpendicular to the axis of rotation (1), determines the position of the motor vehicle wheel (2) and in particular the position of the geometrical axis (8) of the wheel with respect to the axis of rotation (1).

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12. Apparatus according to claim 11 characterised in that the scanning device (3) and the spacing measuring device (4) form a movable spacing measuring unit (10; 11; 12).

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13. Apparatus according to claim 12 characterised in that the spacing measuring unit (10; 11; 12) is in the form of a triangulation measuring device.

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14. Apparatus according to one of claims 11 to 13

characterised in that there are provided three spacing measuring units (10; 11; 12) of which respective spacing measuring units are directed on to the inside of the wheel, the outside of the wheel and the peripheral surface of the wheel.

15. Apparatus according to one of claims 11 to 14

characterised in that the spacing measuring units (10; 11) directed on to the inside of the wheel and the outside of the wheel are mounted pivotably.

16. Apparatus according to one of claims 11 to 15

characterised in that the spacing measuring unit (12) directed on to the peripheral surface of the wheel is mounted movably parallel to the axis of rotation (1).

17. Apparatus according to one of claims 11 to 16

characterised in that the direction of the scanning light beam (21) remains unchanged at least during a revolution of the wheel.

18. Apparatus according to one of claims 1 to 17

characterised in that the rotary angle sensor (6) is non-rotatably coupled to the motor vehicle wheel (2).